TRKAL, Miroslav

New trends in barley classification. Kvasny prum 10 no.10:221-222 O '64.

1. Research Institute of Brewing and Malting Industry Prague, Worksite Brno.

SVEDIROHOVA, Milada; TRKAN, Miroslav; VRTELOVA, Hana

Selecting and testing most suitable varieties of brewing barley in Czechoslovakia. Kvasny prum 9 no.5:122-124 My '63.

1. Vyzkumny ustav pivovarsky a sladarsky, Praha, pracoviste Brno.

DEŽELIĆ, M.; TRKOVNIK, M.

Polarographic study of cumarins. Croat chem acta 33 no.4: 209-217 '61.

1. Kemijski institut, Univerzitet, Sarajevo.

TRKOVNIK, M.; DEZELIC, M.; HUKOVIC, S.

The anticoagulation action of some new synthesized 4-hydroxycoumarin derivatives. Bul sc Youg 7 no.3:62-63 Je '62.

1. Farmakoloski institut Medicinskog fakulteta, Sarajevo. 2. Membre de la Rédaction, "Bulletin scientifique" (for Dezelic).

DEZELIC, M.; LOCKOVIC, A.; TRKOVNIK, M.

Polarographic investigation of pyrroleazomethines. Croat chem acta 32 no.1:31-38 '60. (EEAI 9:12)

1. Kemijski Institut, Filozofski fakultet, Univerzitet, Sarajevo, Bosna i Hercegovina.
(Polarograph and polarography)
(Pyrrolecarboxaldehyde)
(Methylenimine)

TRKOVNIK, M.

A polarographic study of pyrrole-azomethines. M. Deželić, A. Lacković, and M. Trkovnik (Univ. Sarajevo, Bosnia and Hercegovina, Yugoslavia). *Croat. Chem. Acta* 32 31-38(1960)(in German).—The polarographic redn. of azomethines of pyrrole-2-carboxaldehyde (condensation products with aniline, *p*-toluidine, *p*-anisidine, *p*-phenylenediamine, *p*-aminosalicylic acid, sulfadiazine, isoniazid and *p*-aminoazotoluene) is described. The azomethines undergo rapid hydrolysis in acid solns. between pH 1 and 6, giving the pyrrole-2-aldehyde redn. wave only. In neutral or slightly alk. solns. (pH 8-10) a 3-step redn. takes place. The isoniazid condensation product showed only 2 redn. steps, the aminoazotoluene 4. An interpretation of the probable mechanism of these stepwise redns. in terms of bond strengths is given. V. Pravdic (CCA)

DEZELIC, M.; TRKOVNIK, M.

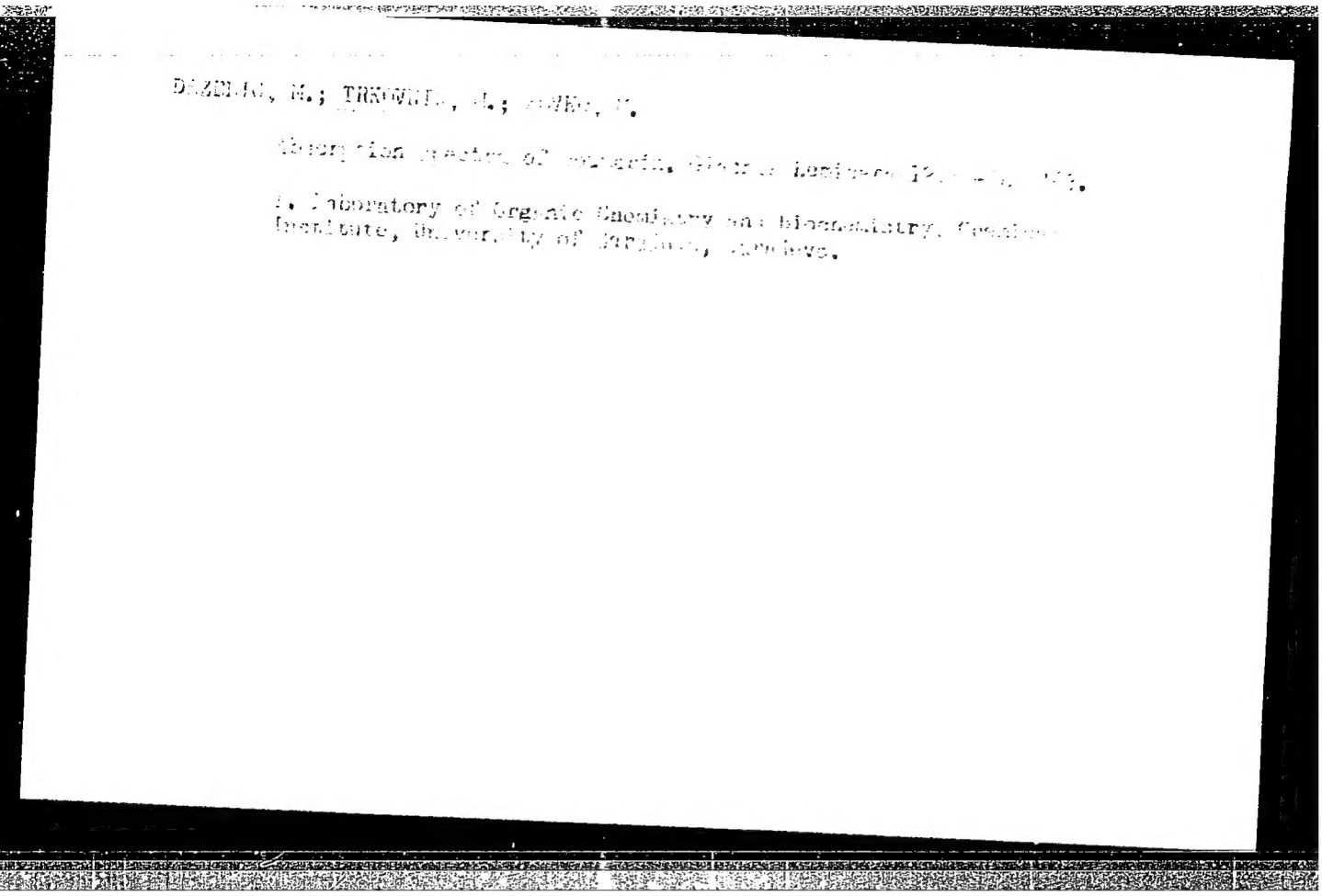
Polarographic studies on coumarin derivatives. Pt. 2. Croat chem acta 35 no.1:43-49 '63.

1. Hemijski institut, Univerzitet, Sarajevo.

TRKOVNIK, Mladen, doc. dr

Use of turpentine oil, and production of camphor and boryl chloride and toxaphene insecticides. Kem ind 13 no. 7:463-471 Jl '64.

1. Faculty of Natural Sciences and Mathematics, University of Sarajevo, Sarajevo.



DEZELIC, M.; TRKOVNIK, M.; IVKOVIC, B.; GMELIG-MEYLING, J.

Some derivatives of 3-acetyl-4-hydroxycoumarin. Glasnik hemijara 12: 177-180 '63.

1. Laboratory of Organic Chemistry and Biochemistry, Chemical Institute, University of Sarajevo, Sarajevo.

COUNTRY : YUGOSLAVIA
CATEGORY : Inorganic Chemistry. Complex Compounds C

ABS. JOUR. : RZKhim., No. 1 1960, No. 651

AUTHOR : Shushich, S. K.; Trkulya, S. M.
INST. : Belgrade University
TITLE : On the Conditions of Preparation of Crystalline Precipitates of Definite Chemical Composition. Report II. Preparation of Chemically Pure*
ORIG. PUB. : Zb. radova Pol'oprivrednog fak. Un-t Beogradu, 1957, 5, No 2, 101-111
ABSTRACT : Some of the methods of preparation of $MgNH_4PO_4 \cdot 6H_2O$ (I), described in literature, were verified and the optimal conditions for the same were proposed, including the use of carbonates of alkali metals for the precipitation of I. -- From authors' summary

*$MgNH_4PO_4 \cdot 6H_2O$

CARD: 1/1

SUSIC, Slobodan K.; TRKULJA, Svetozar M.

Concerning the problem of the quantitative precipitation of compounds in the presence of ions of opposite effect. Quantitative determination of $MnNH_4PO_4.H_2O$ in the presence of citric acid. Glas Hem dr 25/26 no.1/2:141-147 '61.

1. Poljoprivredni fakultet, Zavod za hemiju i tehnologiju, Beograd.

(Precipitation (Chemistry)) (Ions)

TRLIDA, Josef

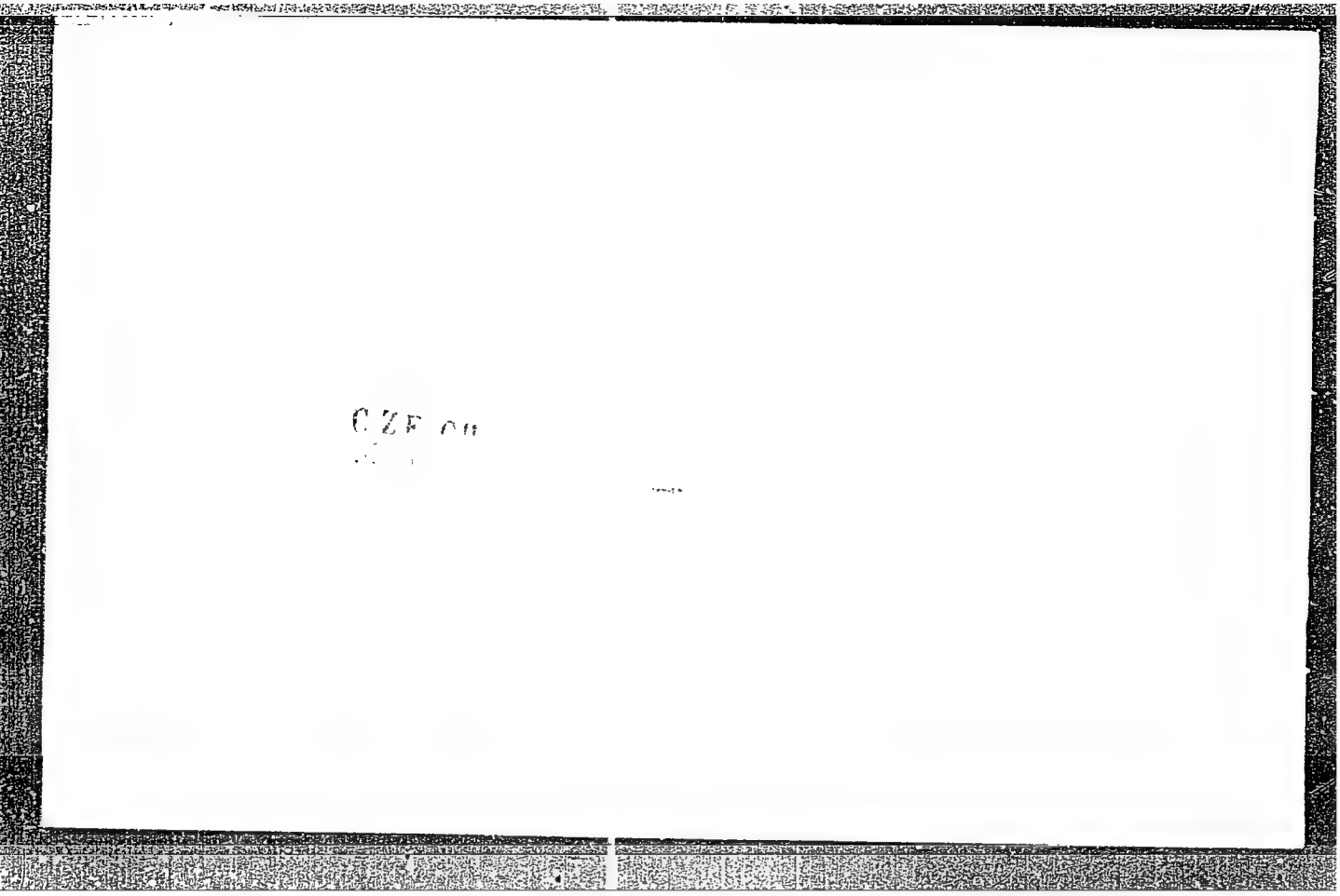
Experience with the new wage system in the automobile transportation. Prace mzda 10 no.4:172-176 Ap '62.

1. Pragodev, n.p., Praha.

Fenyi, J.

"Static Model of the Nucleon." p. 237,
(CESKOSLOVENSKY CASOPIS PRO FYSIKU, Vol. 4, No. 3, June 1954, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4
No. 5, May 1955, Uncl.



TRIFAJ, L.

Distr: 4E2a(c)

Homogenizing the heterogeneous medium. Ladislav Trifaj. *Czechoslav. J. Phys.* 6, 509–15(1956).—By means of math. calcns. it is considered how far various substances, which absorb neutrons to a different extent and which are used for the construction of reactors (for example, D_2O, graphite, Al) in mixts., can be taken to be homogeneous. T. arrives at the conclusion that mixts. of substances can be considered as homogeneous mixts., and that in first approxn. the corrections for heterogeneity can be neglected, if the various substances absorb only weakly. Strongly absorbing substances do not permit such a procedure. From *C.Z.* 1958, 7024. F. K. G.

[illegible]

CZECHOSLOVAKIA/Nuclear Physics - Penetration of Charged and Neutral Particles Through Matter. C-6

Abs Jour : Ref Zhur - Fizika, No 6, 1958, No 12748

Author : Trlifaj Ladislav
Inst : Not Given
Title : On the Anisotropy of a Heterogeneous Medium with Respect to the Diffusion of Neutrons. I.

Orig Pub : Chekhosl. fiz. zh., 1957, 7, No 4, 397-409

Abstract : The author considers the anisotropy of a heterogeneous medium, which consists of regularly alternating layers of two different media. The monoenergetic neutrons enter into the heterogeneous medium from a permanent flat source located at infinite. The author investigates the dependence of the homogenized diffusion constants on the mutual orientation of the heterogeneity of the medium and on the direction of the neutrons that enter into the medium. Instead of this direction, he chooses, for the case of an active medium, the direction of the normal of the extrapolated boundary of a flat reactor.

Card : 1/3

CZECHOSLOVAKIA/Nuclear Physics - Penetration of Charged and Neutral Particles Through Matter. C-6

Abs Jour : Ref Zhur - Fizika, No 6, 1958, No 12748

The author derives first the integral equations of the kinetic theory for the fundamental moments that determine the neutron flux. He assumes here a microscopic anisotropy of the scattering of neutrons of the P-wave type in both media.

To be able to effect uniquely the homogenization of the heterogeneous medium and to investigate the anisotropy of such a medium relative to the diffusion of the neutrons, the inverse of the diffusion length must be much less than the thickness of the layers of both media ($\varkappa_0 \ll 1$). This condition limits the usable heterogeneous media.

The author next considers in detail a heterogeneous medium, in which the microscopic scattering is isotropic. The integral equation of the kinetic theory is solved for the neutron flux with the aid of the variational method, and the homogenized diffusion constants are determined.

From the overall point of view, the results obtained in an

Card : 2/3

18

CZECHOSLOVAKIA/Nuclear Physics - Penetration of Charged and Neutral Particles Through Matter C-6

Ab's Jour : Ref Zhur - Fizika, No 6, 1958, No 12748

earlier work by the author (Referat Zhur Fizika, 1957, No 9, 22209) are confirmed. The homogenized constants are unisotropic in the case of finite thickness of layers and are isotropic when these thicknesses tend to zero. In this case their value becomes equal to the value for the corresponding homogeneous mixture. This result disagrees with the result of Spinrad (Referat Zhur Fizika, 1956, No 8, 22172). The discrepancy is attributed to the fact that the elementary diffusion theory is not applicable in the present investigation (thin layers).

Card : 3/3

TRLIFAJ, L.

CZECHOSLOVAKIA/Nuclear Physics - Nuclear Power and Technology C-8

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20046

Author : Trlifaj Ladislav
Inst : Institute of Nuclear Physics, Praguo, Czechoslovakia.
Title : On the Anisotropy of a Heterogeneous Medium with Respect to Diffusion of Neutrons, II.

Orig Pub : Coskosl. casop. fys., 1957, 7, No 5, 468-477

Abstract : An investigation was made of the anisotropy of the diffusion of neutrons in the case of a layered heterogeneous media with cylindrical and spherical symmetries. The diffusion length and the mean neutron flux of the homogenized medium, which scatters the neutrons anisotropically for each elementary scattering act, were calculated.

Card : 1/1

24

Anisotropy of a heterogeneous medium with respect to the diffusion of neutrons. II. Ladislav Tříska. *Czechoslov. J. Phys.* 7, 123-33 (1957) (in English).—A math. theory of T. (*ibid.* 397) is further developed to investigate the anisotropy of neutron diffusion in a stratified heterogeneous medium which possesses cylindrical or spherical symmetry. Some reactors using fast neutrons, such as Godiva, can fairly well be understood by means of a relation of the one-group theory. The heterogeneity of the medium generally has importance with respect to the size of the reactor. Quant. investigation of the anisotropy is not easy because the numerical evaluation of planar cases on grounds of the kinetic theory is involved, even in simplified approximations. The calcn. of the homogenized inverse value of the diffusion length and the calcn. of the mean neutron flux in a double layer are done on the assumption of the anisotropy of the elementary scattering of the neutrons, and are for a plane source at infinite distance which is simultaneously parallel to the stratifications. In spite of the simplifications introduced, the numerical procedure is very complicated and has not been attempted; only the general formulas are given. Manfred Mannheimer

CZECHOSLOVAKIA/Nuclear Physics - Nuclear Power and Technology C-8

Abs Jour : Ref Zhur - Fizika, No 6, 1958, No 12785

Author : Trlifaj Ladislav, Ulehla Ivan
Inst : Not Given
Title : Basic Physical Calculations for a Heavy Water Reactor with Natural Ruanium

Orig Pub : Rozpr. CSAV Rada MPV, 1957, 67, No 11, 52s.

Abstract : With the aid of a one-group method of diffusion theory, the author has made the calculations for a heterogeneous reactor, with natural uranium, heavy water moderator, and graphite reflector.

Card : 1/1

TRLIFAJ, Ladislav

The second international conference on peaceful use of atomic energy will meet in Geneva. Jaderna energie 4 no.8:209 Ag '58.

1. Predseda Komise pro pripravu ceskoslovenske ucasti na II. zenevske atomove konferenci.

24.3500

67098

AUTHOR: Ladislav Trlifaj

CZECH/37-59-6-14/25

TITLE: Remarks regarding a Paper by M. Trlifaj (Ref 1) (Letter to the Editor)

PERIODICAL: Československý Časopis Pro Fysiku, 1959, Nr 6, p 664

ABSTRACT: In Ref 1 the mean lifetime of a luminescent process due to radiative annihilation of an internal exciton and an impurity exciton is calculated. The mean lifetime of these processes depends on the concentration of impurities. The theoretical curves are in very good agreement with experiments, but we shall show in this note that they can be derived in a much simpler manner. If $\overline{P(t)}$ is the total probability of excitation of basic molecules of the crystal during time t, then according to Ref 1: $\overline{P(t)} = \sum_i P_i(t)$. The total probability of excitation of impurity molecules can similarly be expressed as: $\overline{W(t)} = \sum_a W_a(t)$. Ref 1 assumes that the transfer of excitation energy occurs in regions in which the

Card 1/3

4

Remarks regarding a Paper by M. Trlifaj (Ref 1)

individual probabilities $P_i(t)$ and $W_a(t)$ change only very slowly as a function of the position of the molecules. It further assumes that the transfer depends on the relative distance between the molecules only. From Eqs (1.1) and (1.2) in Ref 1, we may write Eq (1.1):

$$\frac{d}{dt}\overline{P(t)} = -\frac{1}{\tau}\overline{P(t)} + \frac{1}{\tau_{10}}\overline{W(t)} \qquad (1.1)$$

and Eq (1.2):

$$\frac{d}{dt}\overline{W(t)} = -\frac{1}{\tau'}\overline{W(t)} + \frac{1}{\tau_{01}}\overline{P(t)} \qquad (1.2)$$

where

$$\frac{1}{\tau} = \sum_a c_{ia} + \frac{1}{\tau_0}, \quad \frac{1}{\tau_{10}} = \sum_i d_{ai}, \quad \frac{1}{\tau'} = \sum_i d_{ai} + \frac{1}{\tau_e}, \qquad (1.3)$$

Card 2/3

$$\frac{1}{\tau_{01}} = \sum_a c_{ia} .$$

Eqs (1.1) and (1.2) do not contain factors due to non-radiative transfer of excitation energy from a molecule

Remarks regarding a Paper by M. Trlifaj (Ref 1)

to another molecule of the same type because of the symmetry of the probabilities $a_{ii'} = a_{i'i}$ and $b_{\alpha\alpha'} = b_{\alpha'\alpha}$. The quantities $\overline{P(t)}$ and $\overline{W(t)}$ are the only quantities needed for the physical arguments of Ref 1. Their dependence upon time can be found very easily from the boundary conditions:

$$\overline{P(0)} = \overline{P_0}, \quad \overline{W(0)} = \overline{W_0}, \quad \text{where } \overline{P_0} + \overline{W_0} = 1.$$

The results thus obtained are identical with those of Ref 1, Eqs (2.14) - (2.19) (neglecting the printing errors). It is further evident that in the model of a continuous crystal, Eqs (1.24) and (1.25) of Ref 1, we can simply integrate the above equations over all space to obtain Eqs (1.1) and (1.2) of the present note because:

$$\int d^3\bar{r} \text{ div grad } P(\bar{r}, t) = 0 \quad \text{and}$$
$$\int d^3\bar{r} \text{ div grad } W(\bar{r}, t) = 0.$$

Card 3/3

This is an abridged translation.
There is 1 reference (Czech).

ASSOCIATION: Ústav jaderného výzkumu ČSAV Praha (Nuclear Research Institute, Czech Acad.Sci., Prague)

SUBMITTED: March 24, 1959

24.6500

S/089/62/012/006/010/019
B102/B104

AUTHOR: Trlifaj, L.

TITLE: Two-group plane boundary conditions in square lattices

PERIODICAL: Atomnaya energiya, v. 12, no. 6, 1962, 519 - 522

TEXT: This is the continuation of an earlier paper (Trlifaj, Atomnaya energiya, 11, no. 3, 221, 1961) in which the problem was described and the method developed. Another arrangement of the lumps, different from that in the above paper is discussed. The lattice square is assumed to be divided diagonally with one part containing lumps different from those in the other part. Neutron moderation and diffusion functions for the moderator are given in two-group approximation, whence the homogenized boundary conditions are obtained at "extrapolated points". On physically reasonable assumptions the thermal-neutron densities and their derivatives at the boundary are almost continuous, and the extrapolated boundary lies in the middle between the blocks of the two types. Similar calculations were made for the case where the second type of blocks is replaced by an infinite reflector.

Card 1/2

Two-group plane boundary conditions ... S/089/62/012/006/010/019
B102/B104

ASSOCIATION: Institut yadernykh issledovaniy, ChSAN, Praga (Institute of Nuclear Research, Czechoslovakian AS, Prague)

SUBMITTED: October 2, 1961

/B

Card 2/2

TRLIFAJ, Ladislav

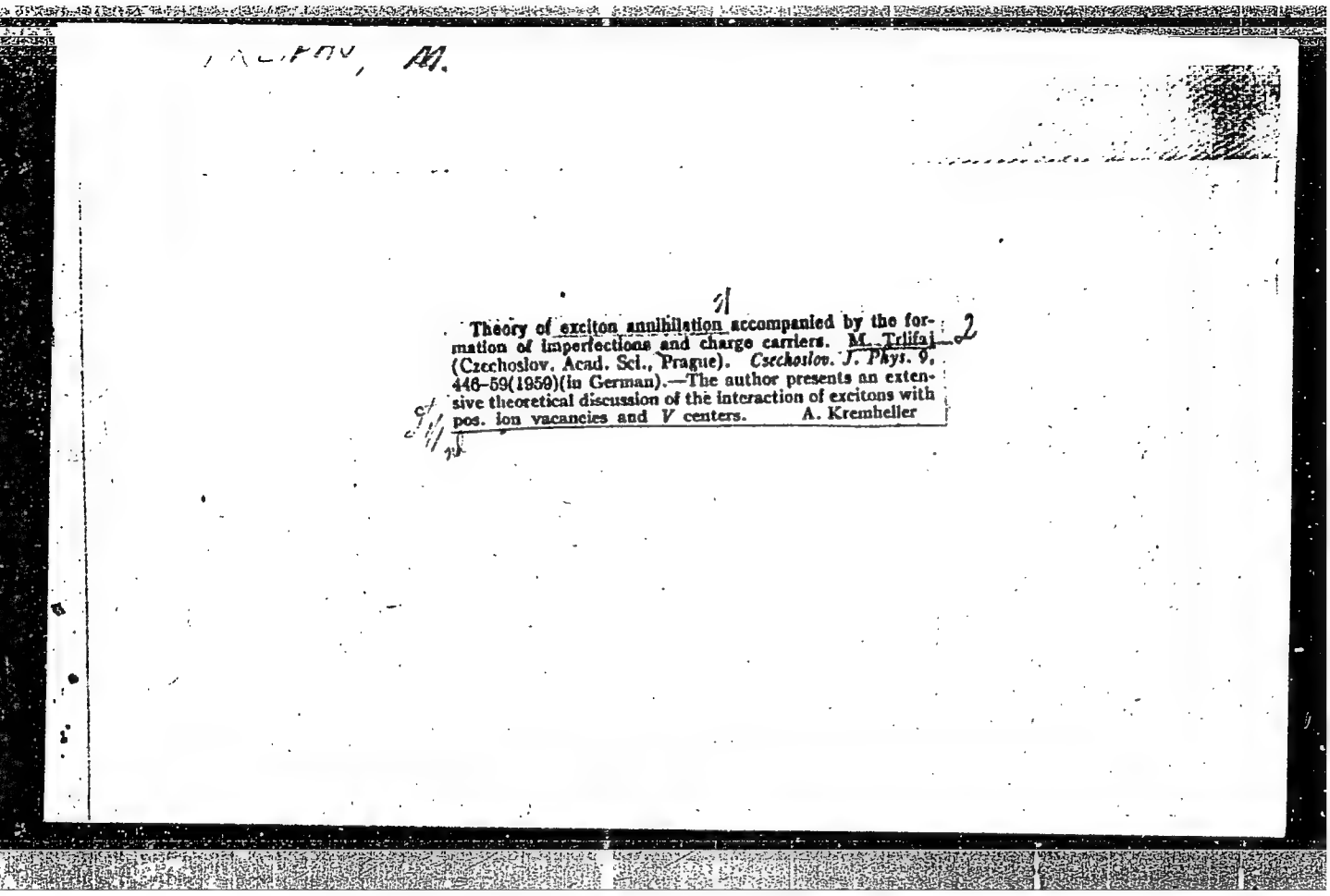
The 4-particle wave function in the U_3 schema. Jaderna energie 10 no.7:255 Jl'64

1. Institute of Nuclear Research, Czechoslovak Academy of Sciences, Rez.

TRLIFAJ, L.

The 4-particle wave function in the SU_3 scheme. Chekhoslfiz zhurnal 14 no.5:302-308 '64.

1. Institute of Nuclear Research, Czechoslovak Academy of Sciences, Rez.



TRLIFAJ, M.

Theory of exciton annihilation accompanied by the formation of imperfections and charge carriers. M. Trlifaj (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 9, 446–59(1959)(in German).—The author presents an extensive theoretical discussion of the interaction of excitons with pos. ion vacancies and *V* centers. A. Kremheller

Distr: 4E1x(g)/4E2d(b) 2 cys

21

The trapping of excitons by point imperfections of the crystal lattice. Miroslav Trlifaj (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 9, 502–71(1959)(in German). —In continuation of a previous publication (cf. preceding abstr.), the author discusses the trapping of excitons by vacancies and *F* centers. The motion of excitons is studied by considering the adiabatic approxn., and classical methods are employed to det. the capture cross section for trapping of excitons by vacancies and *F* centers. A. Kremheller

2
1-ISP(c)
3

CZECHOSLOVAKIA/Solid State Physics - Solid State Theory - Crystallo- E
Graphy

Abs Jour : Ref Zhur - Fizika, No 12, 1959, No 27315

Author : Trlifaj, Miroslav

Inst : -

Title : The Diffusion Energy in Molecular Crystals

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 5, 510-520

Abstract : See Abstract 27314.

Card 1/1

CZECHOSLOVAKIA/Solid State Physics - Solid State Theory - Crystallo- E
graphy

Abs Jour : Ref Zhur - Fizika, No 12, 1959, 27314

diffuse, carrying out random jumps from one molecule to another. The probability of transition of the exciton to the neighboring molecules is calculated with the aid of the theory of quantum transitions. This probabilitiy is found to be substantially dependent on the Stokes shift Δ E for the maxima of absorption and emission of light by the crystals and diminishes exponentially with increasing Δ E. The probability of transition may have a strong temperature dependence owing to the temperature dependence of Δ E. With the aid of the expressions obtained for the probability of transition, formulas are derived for the coefficient of diffusion of the excitons and the diffusion length over the optical lifetime. The

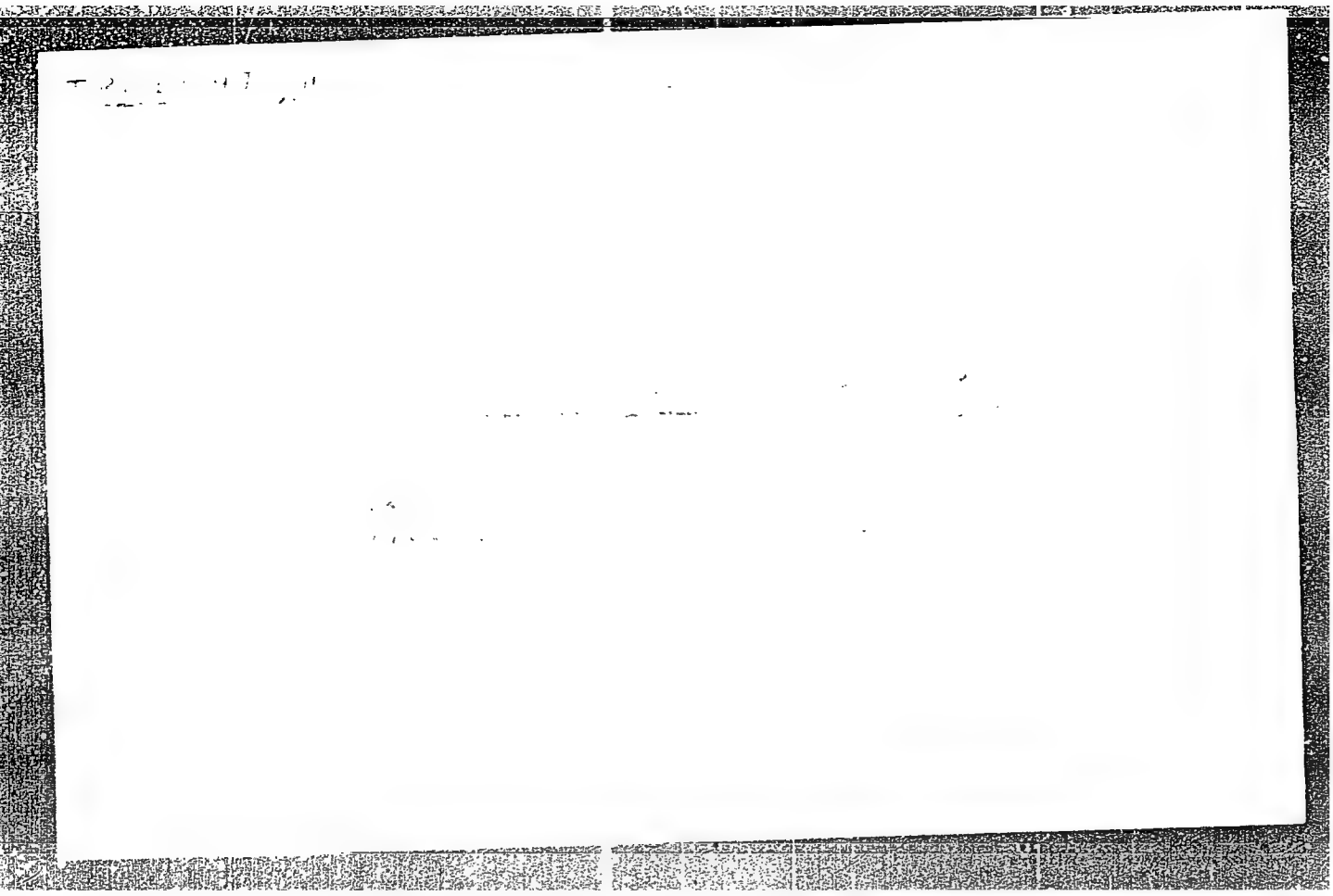
Card 2/3 - 44 -

CZECHOSLOVAKIA/Solid State Physics - Solid State Theory - Crystallo- E
graphy

Abs Jour : Ref Zhur - Fizika, No 12, 1959, 27314

resultant formulas are applicable to the case of diffusion of excitons in anthracene. The calculated value of the diffusion length is approximately 460 Å and is in satisfactory agreement with the experimental data. -- M.A. Krivoglaz

Card 3/3



DEZELIC, M.; TRKOVNIK, M.

Polarographic studies on coumarin. Croat chem acta 33 no.4:209-217 '61.

1. Kemijski institut, Univerzitet, Sarajevo.

CZECHOSLOVAKIA/Optics - Spectroscopy

II-7

Abs Jour : Ref Zhur - Fizika, No 5, 1959, No 11842

Author : Trlifaj Miroslav
Inst : -
Title : Properties of Excitons Formed During the Passage of Fast Particles to a Crystal.

Orig Pub : Ceskosl. casop. fys., 1957, 7, No 6, 634-640

Abstract : See Referat Zhur Fizika, 1959, No 2, 4479

Card : 1/1

CZECHOSLOVAKIA/Electronics - Semiconductors. H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6462

Author : Trlifaj Miroslav

Inst : Physics Institute, Czechoslovak Academy of Sciences, Prague

Title : Theory of Exciton Annihilation Accompanied by the Occurrence of Defects of a New Type and of Current Carriers.

Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 4, 446-459

Abstract : An investigation was made of the process of annihilation of excitons on vacancies and F-centers in ionic crystals. The annihilations are accompanied by the occurrence of a new type of center and of current carriers. General expressions are derived and evaluated for the corresponding effective cross sections in the quasi-classical approximation.

Card 1/1

4
2

Distr: 4E2c/4E3d

The interaction of excitons with the oscillations of the crystal lattice. Miroslav Trlifaj. *Czechoslov. J. Phys.* 7, 379-80(1957). A study is made of the energy spectrum of a Frenkel-type exciton which interacts with the oscillations of the crystal lattice for two limiting cases: for weak interaction with the oscillations of the lattice, and for a "localized" exciton. The problem is solved by a variational method analogous to the method Gurari (*C.A.* 51, 9287*f*) and Tyablikov (*C.A.* 49, 11397*h*) employed in the theory of polarons. In both cases an increase in the effective mass of the exciton and decrease in the bottom of its energy band was obtained. A criterion was found making possible the quant. detn. of the character of coupling of the exciton with the oscillations of the lattice. N. I. Silverman.

CZECHOSLOVAKIA/Electricity - Semiconductors G-3

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20682

Author : Trlifaj Miroslav
Inst : Not Given
Title : Theory of the Non-radiative Recombination of Electrons at Perturbation Centers in Polar Cyrstals.

Orig Pub : Chekhosl. fiz. zh., 1957, 7, No 6, 657-666

Abstract : See Abstract 20681.

Card : 1/1

TRLIFAJ, L.

Homogenization of heterogeneous fields. p. 509. (CESKOSLOVENSKY CASOPIS PRO FYSIKU, Vol. 6, No. 5, Sept 1956, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

CZECHOSLOVAKIA/Nuclear Physics - Penetration of Charged and Neutral C-6
Particles Through Matter

Abs Jour : Ref Zhur - Fizika, No 2, 1959, No 2887

Author : Trlifaj Ladislav
Inst : -
Title : On the Solution of the Kinetic Equation for the Diffusion of Neutrons in a Cylindrical Homogeneous Medium by the Method of Spherical Harmonic Functions

Orig Pub : Ceskosl. casop. fys., 1958, 8, No 3, 279-284

Abstract : No abstract

Card : 1/1

CZECHOSLOVAKIA/Nuclear Physics - Nuclear Power and Technology C-8

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20045

Author : Trlifaj Ladislev
Inst : Not G ivon
Title : Anistropy of Heterogeneous Medium Relative to Diffusion of Neutrons, I.

Orig Pub : Ceskosl. casop. fys., 1957, 7, No 4, 325-335

Abstract : See Referat Zhur Fizika, 1958, No 6, 12748

Card : 1/1

TRLIFAJ, L.

Anisotropy of heterogeneous surroundings from the point of view of neutron diffusion. I.

Page. 325 (Ceskoslovenska Morfolorgie. Vol 7, no. 4, 1957 Praha, Czechoslovakia)

Monthly Index of East European Accession (EEAI) LC. Vol. 7, no. 2, February 1958

TRLIFAJ, L.; ULEHLA, I.

Calculation of a hetrogeneous D_2O-moderated reactor operating with natural uranium.

p. 1(Rozpravy. Rada Matematicko-Prirodovedecka) Vol. 67, no. 11, 1957. Praha. Czech.

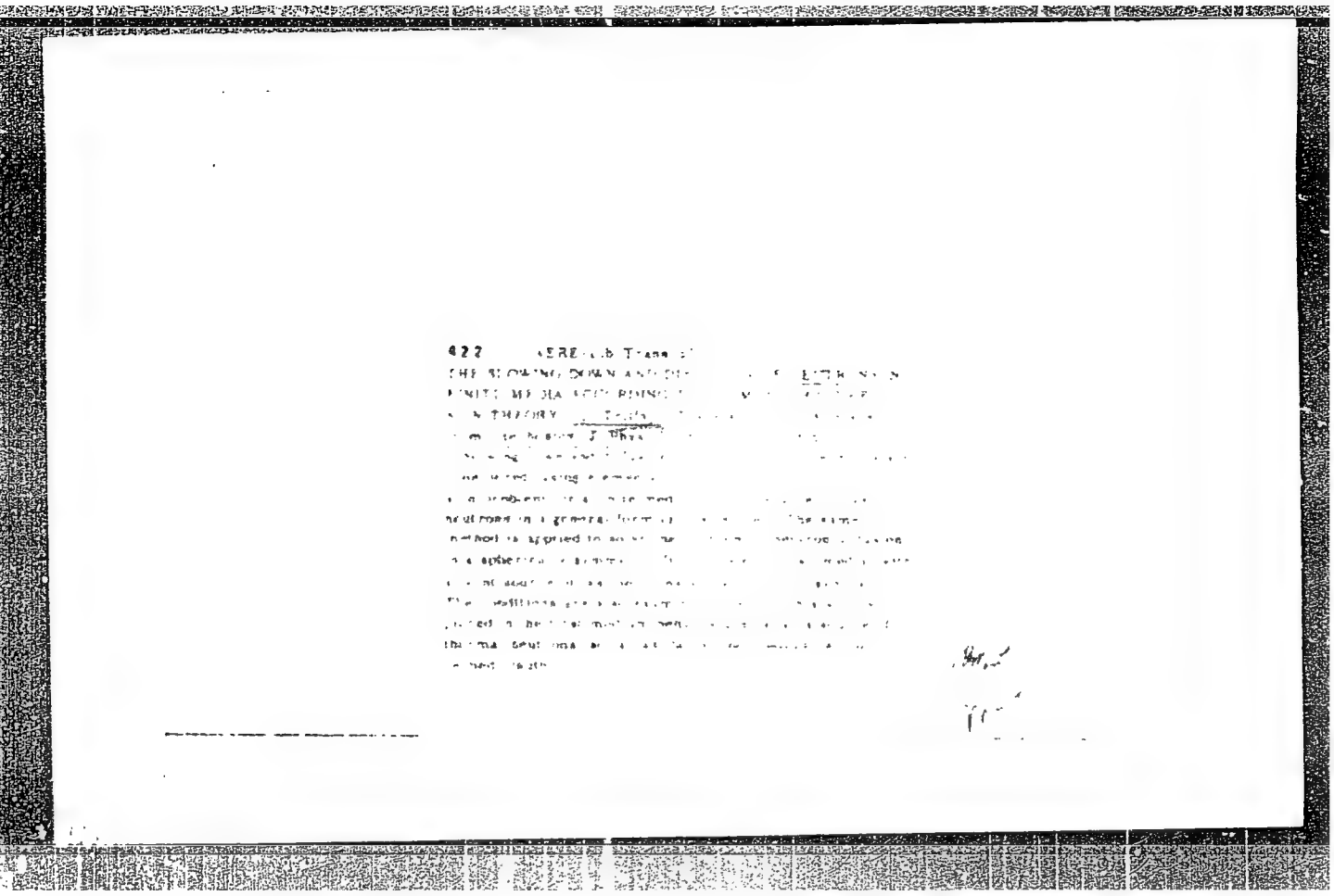
SO: Monthly Index of East European Accessions (EEAI) LC, Vol. 7, no. 1, Jan 1958

TRLIFAJ, L.

Anisotropy of heterogeneous surroundings from the point of view of neutron diffusion. II.

p. 469 (CESKOSLOVENSKY CASOPIS PRO FYSIKU) Vol. 7, no. 5, 1957, Praha, Czechoslovakia

SO: Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 3, March 1958



CZECHOSLOVAKIA/Optics - Spectroscopy K-7

Abs Jour : Ref Zhur - Fizika, No 2, 1959, No 4479

Author : Trlifaj Miroslav
Inst : -
Title : Properties of Excitons Formed Upon Passage of Fast Charged Particles Through a Crystal

Orig Pub : Chekhosl. fiz. zh., 1957, 7, No 6, 667-673

Abstract : The author calculates the probability of formation of excitons on a crystal when fast charged particles pass through the crystal. Under the action of heavy charged particles there are excited only singlet states. At the same time, under the action of fast electrons, owing to the presence of exchange effect, there are excited also triplet states along with the singlet states. If the optical transition in the atom is forbidden, the probability of excitation os singlet and triplet states are of the same order of magnitude. The excitation of long-lived triplet states can change substantially the character of the luminescence. The length of the lumin-

Card : 1/2

TRLIFAJ MIROSLAV

CZECHOSLOVAKIA/Solid State Physics - Solid State Theory E-2

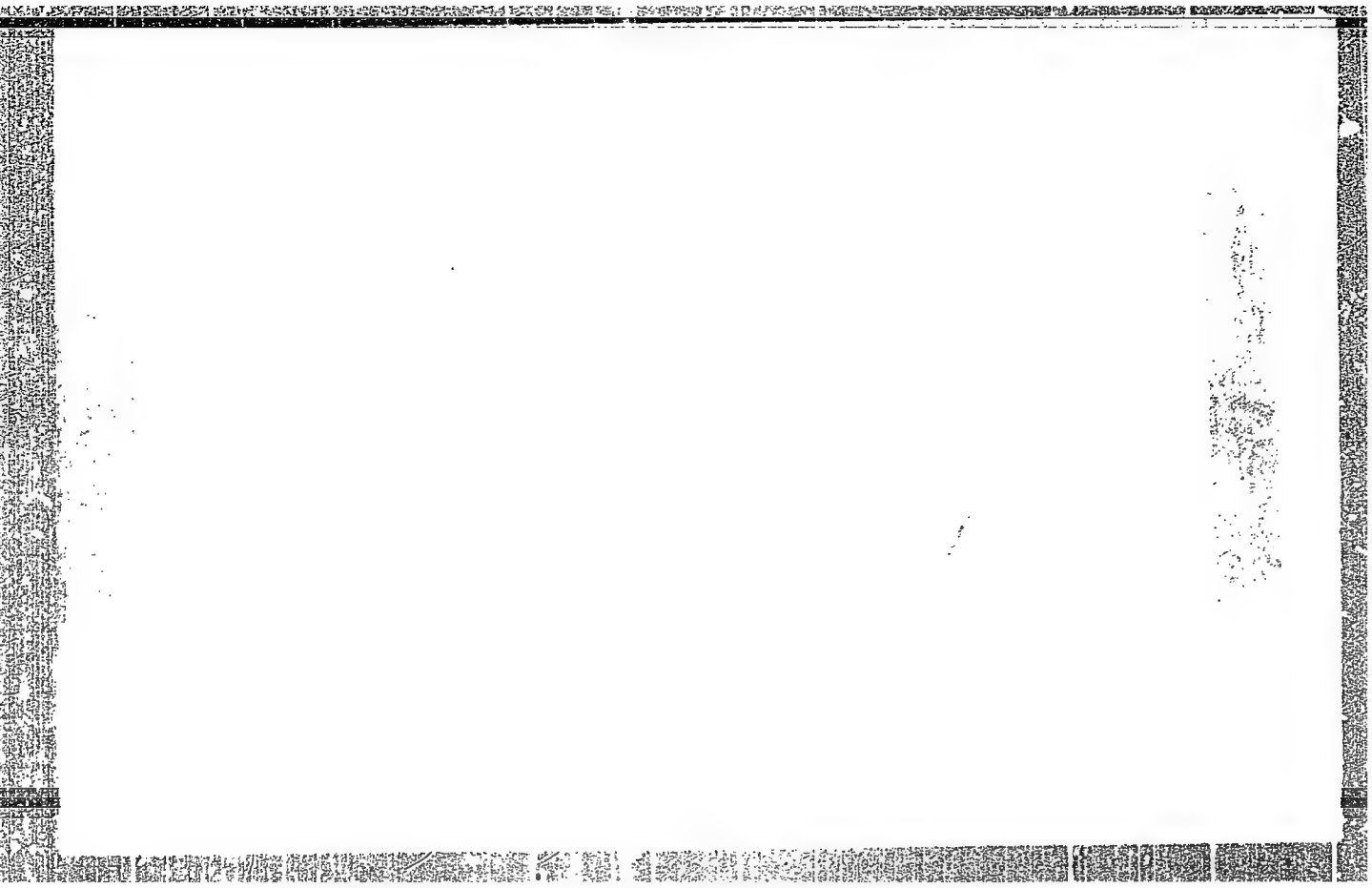
Abs Jour : Ref Zhur-- Fizika, No 5, 1958, No 10542

Author : Trlifaj Miroslav
Inst : Physics Institute, Czechoslovak Academy of Sciences, Prague, Czechoslovakia
Title : Mutual Influence of Excitons and Vibrations of the Crystalline Lattice.

Orig Pub : Ceskosl. casop. fys., 1957, 7, No 2, 113-122

Abstract : The theory of an exciton interacting with the vibrations of the crystalline lattice is developed. The energy spectrum in the effective mass of the exciton are determined in two limiting cases: in the case of weak interaction between the exciton in the vibrations of the crystalline lattice and in the case of the so-called "localized" exciton. A quantitative criterion is fine for the character of the connection between the excitons and the vibrations of the crystalline lattice.

Card : 1/1



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TRLIFAJ M.

Theory of the nonradiative recombination of electrons at perturbation centers in polar crystals. Miroslav Trlifaj (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 7, 657–66(1957)(in English).—A math. theory is developed of nonradiative recombination of electrons at a perturbation center in a polar crystal. The process is treated as a single phonon transition of a polaron in a nonadiabatic approximation from a continuous distribution to the discrete excited state in the perturbation center. It is assumed that the perturbation which causes a transition represents the interaction of a polaron with a free phonon field which leads to the creation and disappearance of phonons in the environment of the perturbation center. The basic equations are deduced, and the coeff. of recombination and the effective cross section for recombination at a perturbation center of the Coulomb type are derived as a function of the temp. ZnS crystals are treated in detail. Manfred Mannheimer—

AUTHOR: Trlifaj, Miroslav CZECH/37-58-6-1/30

TITLE: Diffusion of Excitation Energy in Molecular Crystals (Difuse excitační energie v molekulárních krystalech)

PERIODICAL: Československý Časopis Pro Fysiku, 1958, Nr 6, pp 633-642 (Czech)

ABSTRACT: Excitons, apart from their interactions with lattice defects, interact with phonons. The mean free path associated with collisions between phonons and excitons determines the diffusion of the latter. If the mean free path is only of the order of magnitude of the lattice constant, then the region of coherence of the exciton is too small for it to be characterised by a single wave vector $\vec{K}$. In this case, the motion of the exciton may be better described as random jumps of the excitation-state from one molecule to another. This situation occurs with localised excitons, where the excited state of the molecule leads to a localised deformation of the lattice. The effective mass of a localised exciton equals about $10^4 - 10^5$ times the mass of a free electron (Ref 2) and the mean free path is about 10^{-8} cm.

Cardl/10 For the transfer of the excitation from one molecule to

another an energy of activation ΔU is needed and the probability of such a jump occurring per sec is $w = w_0 \exp(-\Delta U/kT)$ (Ref 3).

A similar situation may arise in organic molecular crystals consisting of large molecules whose absorption and emission spectra in the isolated state show a large Stokes shift, even if, because of the size of the molecules, the excitation does not deform the lattice. The motion of the exciton in such a crystal may be considered as consisting of random jumps of the excitation between molecules, if the lifetime of the excitation in a molecule, as determined by the jumps, is long compared with the relaxation time of the atoms within the molecule and short compared with the relaxation time of the molecules within the lattice.

The energy operator of the crystal (Eq 1) consists of the sum of the energy operators of the separate molecules and of the sum of the energy operators due to the binding forces between the molecules. It is assumed that in the Schrödinger equation for the isolated molecules one can separate the variables so as to obtain the wave function

Diffusion of Excitation Energy in Molecular Crystals

as a multiple of the electronic wave function and the wave function of the nuclei, while the energy will be given as a sum of the electronic energy and the energy due to the oscillating motion of the atoms. In Eqs (2) - (5), (0) marks the ground state, (1) the excited state, ψ_{el} and ψ_{osc} are each separately normalised and the wave functions of the electrons for various excited states are orthogonal. Eq (6) gives the probability that the energy of the oscillator will be between e_{osc} and $e_{osc} + de_{osc}$ and Eq (7) normalises this distribution function.

Neglecting exchange effects, Eqs (8) and (9) give the wave function of the crystal in the ground state and its energy, respectively.

If the p-th molecule is in an excited state while all others remain in the ground state, Eqs (10) and (11) are obtained for the wave function and the energy of the crystal. Eq (10) is not, however, a solution of Schrödinger's equation for the crystal, because the matrix elements:

$$\int \Psi_p^{(1)*} H_{pp'} \Psi_{p'}^{(1)} dv_p dv_{p'} \text{ for } p' \neq p$$

do not vanish.
The wave function for the whole crystal must be a solution of Eq (12). $|a_p(t)|^2$ is the probability that at time t the p-th molecule will be in an excited state. Eq (14) is obtained if one looks for a solution of the type (13) for Eq (12). One of the possible solutions of (14) is (16), which takes $E_p^{(1)} = E_{p'}^{(1)}$ and the translational symmetry of the problem into consideration (Ref 1). If is the total number of atoms and $\bar{R}_p$ are lattice vectors.
The desired wave function of the stationary excited state of the crystal is (18) with energy (19).
It is now assumed that the mean free path of the excitation is roughly equal to the lattice constant, i.e. the coherence of the sum in (18) is limited to one lattice cell. It is therefore assumed that $a_p(t)$ (Eq 13) are mutually

 independent at $t = 0$ and that their phase relationship

Diffusion of Excitation Energy in Molecular Crystals

is randomly distributed within the limiting values of $\vec{K}$. The motion of the excited state is then described by the mean values of:

$$\overline{|a_p(t)|^2} .$$

According to the author (Ref 3), this probability is called the probability of excitation $P_p(t)$. From Eq (13), the time dependence of $a_p(t)$ can be expressed by Eq (2) (Ref 3), where $U_{pp'}(t)$ are the matrix elements of the unitary operator defined by (21). The mean value of the probabilities $|a_p(t)|^2$ over all randomly distributed phases is given by (24). As a first approximation the solution of (21) is (25) (Ref 3), where (26) defines the probability per sec of the transition of the excitation from p to p'. For small t one obtains (27), describing the motion of the excitation energy in the crystal as random jumps from molecule to molecule (Ref 3).

Diffusion of Excitation Energy in Molecular Crystals

Using (10 and (11), we obtain from (26) the probability of the transition of the excitation from molecule p to molecule p' , i.e. Eq (28). Using the definitions and normalisations of (29) to (34), Eq (35) is obtained. According to Dexter (Ref4), this can be rewritten in a dipole-dipole approximation as (36), where $\bar{u}_p$ is the matrix element of the dipole moment of the p-th molecule corresponding to the optical transition of the isolated molecule and K is the dielectric constant. ϑ is the angle between $\bar{\mu}_p$ and $\bar{\mu}_{p'}$, φ_p the angle between $\bar{\mu}_p$ and $\bar{R}_p - \bar{R}_{p'}$.

For the probability per sec $w_p(E)$ of the spontaneous emission of a photon of energy E during the transition of the crystal from a state in which molecule p is excited into the fundamental state, Eq (37) can be derived (n - index of refraction, c - velocity of light). Similarly, the cross-section for the excitation of the P'-th molecule by the absorption of a photon with energy E is given by (39). The absorption and emission spectrum

of the molecule in the crystal is similar to that of the free molecule, except for a shift in energy Δ_{po}. $\int w_p(E)\,dE$ equals the reciprocal of the optical mean lifetime of the excited state of a molecule. Following Dexter (Ref 4), the author introduces a normalised function $f(E)$, describing the emission spectrum, which is given by (37). We then obtain (40) and in a similar way (41). Using these and setting $\epsilon = E - \Delta_{po}$, we can rewrite (36) in the form of (42) or, following the author's earlier work (Ref 5), as Eq (43). $\bar{\sigma}$ is the mean value of the effective absorption cross-section taken over the range of the emission spectrum. $\bar{\lambda}$ is the mean value of the wavelength in the region in which the absorption and the emission spectra overlap. Let E_e and E_a be the maximum energy of the emission- and the absorption-spectrum of the molecule in the crystal, respectively. β and γ depend on the half-widths δ of the spectra as follows:

Card7/10 $\delta_e = (2 \log 2)/\beta^{1/2}$, $\delta_a = (2 \log 2)/\gamma^{1/2}$.

Diffusion of Excitation Energy in Molecular Crystals

We then assume (44) and (45) and obtain from (42) Eq (46), in which ΔE is the Stokes shift. In general, the unit cell contains more than one molecule and their dipole-moments are variously orientated. We then consider the mean value of (43) over all orientations of $\bar{R}_p - \bar{R}_{p'}$ and obtain (47).

We now consider the crystal as a continuum with density n_o of molecules. By Eq (48), w is defined as a function of two positions $\bar{r}$ and $\bar{r}'$ in the crystal. τ_p is defined by Eq (49); it is the lifetime of the excited state on molecule p, considering all transition possibilities to other molecules. $w(\bar{r},\bar{r}')$ (Eq 48) multiplied by d^3r is the probability that the excited state of the molecule will pass in time τ_p from point $\bar{r}'$ to the volume-element d^3r round point $\bar{r}$. w is normalised by (50). Using (48), we can rewrite (27) in the continuum approximation as (51). This equation describes the motion of the excited state in the crystal as

Diffusion of Excitation Energy in Molecular Crystals

Brownian motion without external forces. It can be transformed into Eq (52), which describes the motion as diffusion with a diffusion coefficient given by (53). ρ^2 is the mean value of the square of the translation of the excitation in time τ_p and is of the same order of magnitude as the square of the lattice constant. Inserting (54) and (49) into (53), we obtain (55) and therefore the length of diffusion l of the excited state is given by (56).
Comparison of this result with the few available experimental results is satisfactory, particularly if the possibility of re-absorption (Refs 10,11) is taken into account. A value $l_{calc} \approx 460$ Å is found for anthracene; for the same crystal, $l_{meas.} \approx 460$ Å (Ref 7) or ~ 1500 Å (Ref 8).

There are 11 references, 5 of which are English, 3 Soviet and 3 Czech.

Card9/10

CZECH/37-58-6-1/30

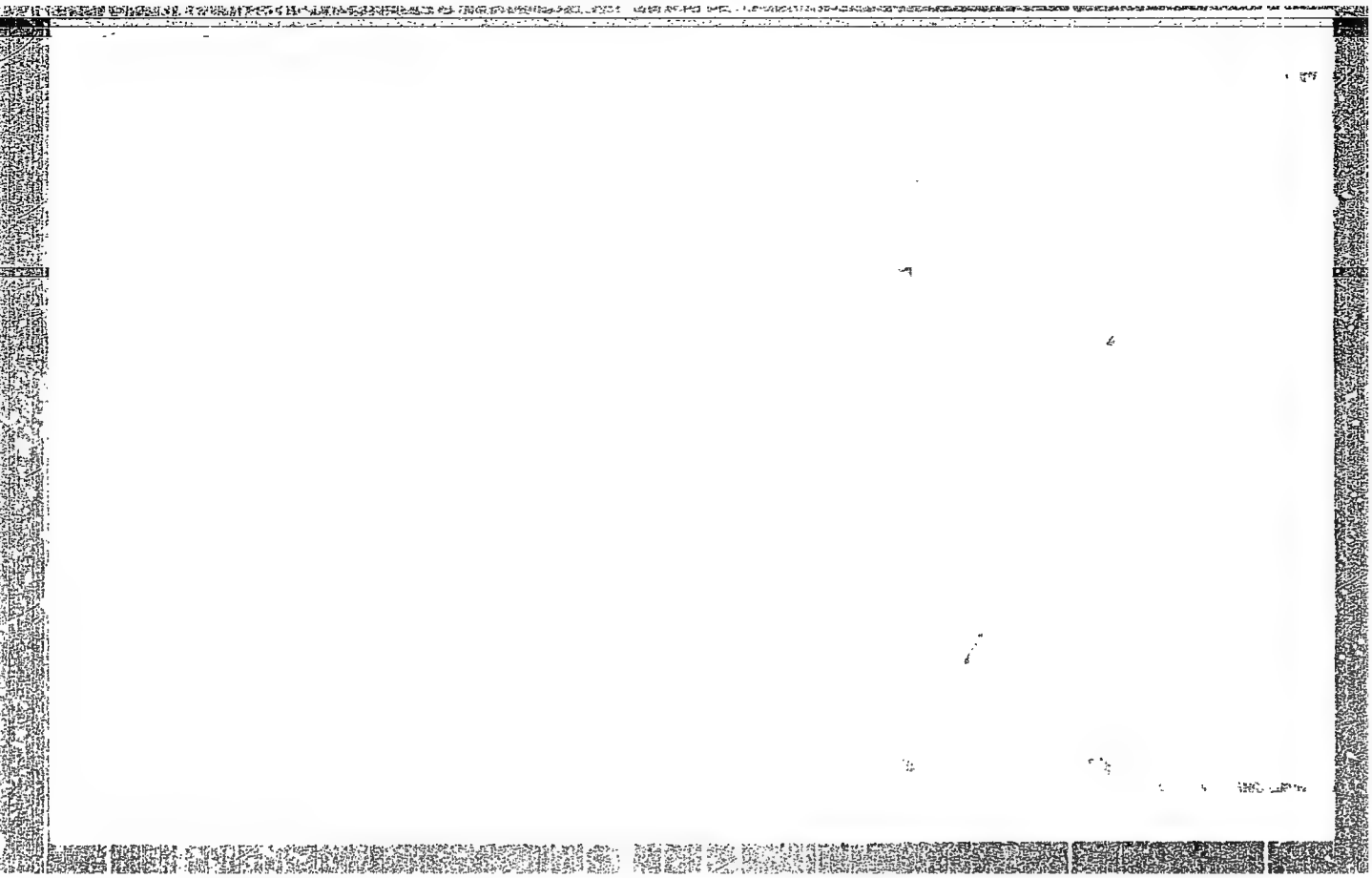
Diffusion of Excitation Energy in Molecular Crystals

ASSOCIATION: Fysikální ústav ČSAV, Praha
(Institute of Physics of the Czechoslovak Ac.Sc., Prague)

SUBMITTED: April 10, 1958

Card 10/10

Diffusion and nonradiative transfer of excitation energy in molecular crystals containing foreign molecules. Miroslav Trlifaj (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 9, 4-13(1959)(in English).—A theoretical calcn. is given, and its relation to the luminescence of crystals is discussed. The theoretical prediction agrees in order of magnitude with the exptl. value of the activation energy for $CaWO_4$:Sm crystals (Botden. *C.A.* 46, 9989i). A. K.



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756620010-3"

TRLIFAJ, M.

Thermic and nonluminous electronic processes in the interferential centers of inonic crystals. p. 1.
CESKOSLOVENSKY CASOPIS PRO FYSIKU Vol. 5, No. 1, Jan. 1955

SO: Monthly East European Accessions List (EEAL),LC, Vol. 4, No. 9, Sept. 1955 Uncl.

TRLIFAJ, M

Theory of resonance transmission of excitation energy in solids. p.599

Vol. 5, no. 6, Nov. 1955
CESKOSLOVENSKY CASOPIS PRO FYSIKU
Praha, Czechoslovakia

So: Eastern European Accession Vol. 5, No. 4, 1956

TRLIFAJ, M"

The contemporary situation regarding the theory of absorption and emission spectra of admixture atoms added to crystals.

p. 104 (Pokroky Fysiky Pevnych Latek) Vol 4 1957. Praha. Czechoslovakia.

SO: Monthly Index of East European Accessions (EEAI) LC, Vol 7 no 1 Jan 1958

TRLIFAJ M

CZECHOSLOVAKIA/Optics - Spectroscopy

K-7

Abs Jour : Ref Zhur - Fizika, No 2, 1958, No 4727

Author : Trlifaj Miroslav
Inst : Not Given
Title : Theory of Diffusion of "Localized" Excitons in Solids

Orig Pub : Ceskosl. casop. fys., 1956, 6, No 4, 372-389

Abstract : See Referat Zhur Fizika, 1957, No 9, 23865

Card : 1/1

TRLIFAJ, Miroslav.

Diffusion of excitation energy in molecular crystals. Miroslav Trlifaj (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 8, 510-20(1958)(in English).—T. attempts to explain theoretically the motion of excitons in a mol. crystal lattice. The mean free path and the propagation of excitons can be described as functions of the computed coeff. of exciton diffusion. The exciton represents an excited mol. state propagated by chance transitions from one mole to another. The theoretical results do not disagree with measurements on anthracene (Wright, *C.A.* 50, 6826).
A. Kremheller

Distr: 4E3c/4E3d

MIROSLAV TRLIFAJ

Properties of excitons produced during the transition of fast charged particles through a crystal (Miroslav Trlifaj)

(Czechoslov. ...)

The ... of excitons ... passage of fast electrically charged particles through crystal lattices, and a calcn, is made of the probability of production of an exciton during this transition. While excitons with a neg. effective mass are produced, the exchange of energy between the exciton and the crystal lattice vibrations is accompanied by an increase in the exciton wave no. (Davydov, *CA* 49, 10045a). As a result of this, exciton energy transfer into luminescence is hampered because the wave vector of the exciton does not correspond to the wave vector of the light wave, and the exciton lifetime will increase owing to irradiation. Under certain conditions, triplet excitons can also be produced during passage of electrons through a crystal, and metastable states with fairly long lifetimes can be formed in the crystal. Luminescence therefrom may be different from that conditioned by an exciton produced by conventional optical excitation of the luminescence ...

TRLIFAJ, M.

Mutual effect of excitions and vibrations of crystal lattices.

P. 113 (Ceskoslovenska Morfologie. Vol. 5, no. 4, 1957, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 2, February 1957

TRLIFAJ, M.

The contemporary situation regarding the theory of absorption and emission spectra of admixture atoms added to crystals.

p. 104 (Meteorologicke Zpravy) Vol 10 no 3 June 1957. Praha, Czechoslovakia

SO: Monthly Index of East European Accessions (EEAI) LC Vol 7 no 1 Ja n1958

ACCESSION NR: AP4033423 Z/0055/64/014/004/0227/0239

AUTHOR: Trlifaj, M.

TITLE: Nonradiative ionization of perturbation centers by means of excitons in semiconducting and dielectric crystals

SOURCE: Chekhoslovatskiy fizicheskiy zhurnal, v. 14, no. 4, 1964, 227-239

TOPIC TAGS: semiconducting crystal, dielectric crystal, electron confinement, perturbation center, trapped electron, ionization, nonradiative ionization, exciton, recombination, perturbation center density, perturbation center ionization

ABSTRACT: Nonradiative ionization of a perturbation center formed by an electron trapped in the Coulomb field of the perturbation by means of excitons of large radius in semiconducting and dielectric crystals is theoretically investigated. It is shown that such nonradiative ionization may occur by two processes: the direct nonradiative transfer of the excitation energy from the exciton to the electron of the perturbation and by exchange nonradiative ionization whereby the electron on the perturbation recombines nonradiatively with the hole in the exciton and the electron of the exciton with the energy released during this recombi-

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ACCESSION NR: AP4033423

nation passes to the ionized state of the perturbation. The corresponding probabilities per sec and recombination coefficients are calculated as a function of the concentration of perturbation centers and the type of exciton according to its optical origin. The result is used for a theoretical estimate of the influence of perturbation centers of the given type on the optical life-time of the exciton. [Author's abstract modified]. Orig. art. has: 68 formulas.

ASSOCIATION: Institute of Physics, Czechosl. Acad. Sci., Prague

SUBMITTED: 22Jul63 DATE ACQ: 01May64 ENCL: 00

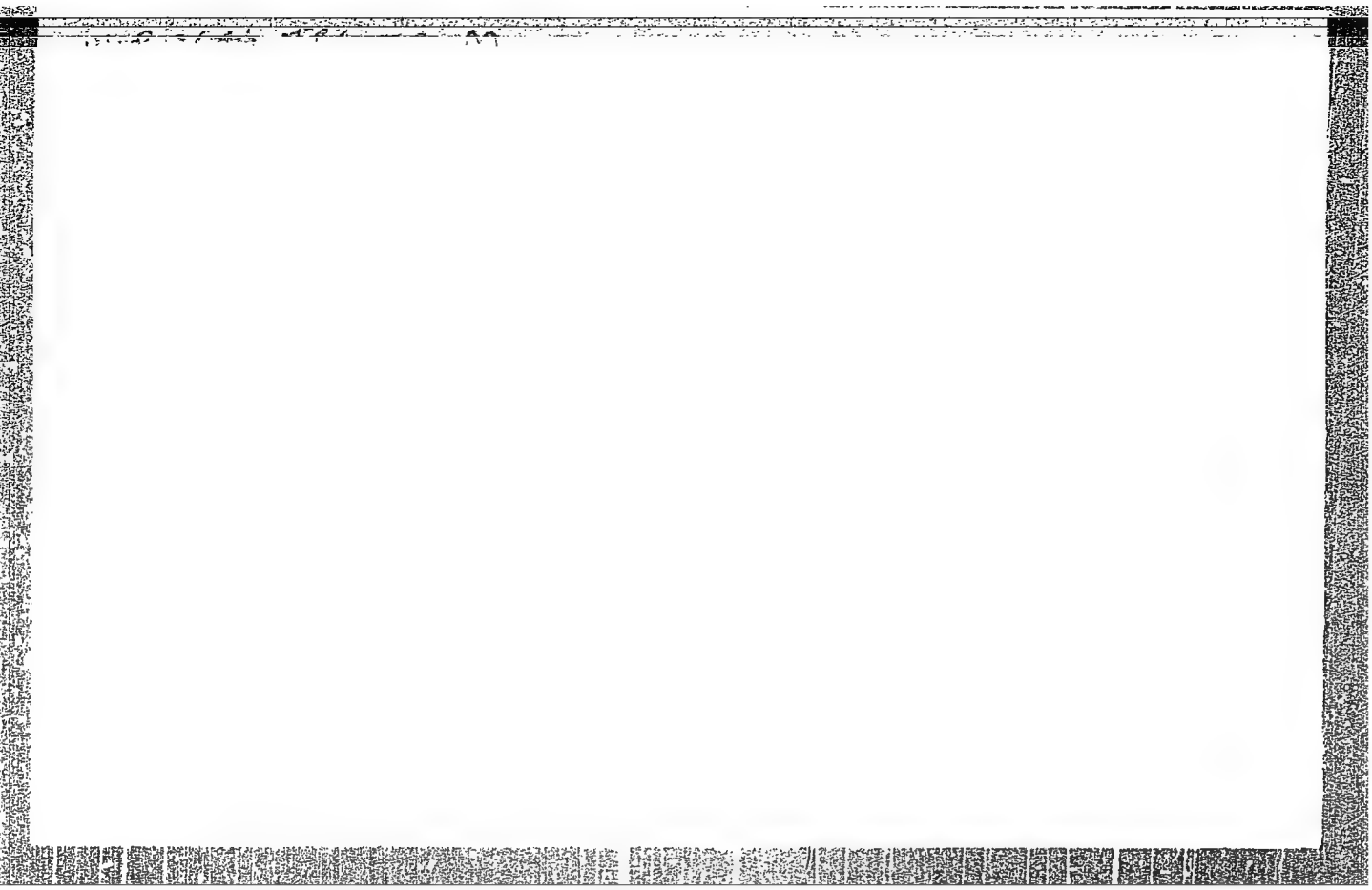
SUB CODE: GP NO REF SOV: 003 OTHER: 006

Card 2/2

Trlifaj, M.

Thermal dissociation energy and the basic state of center F_2^*. P. 123
CESKOSLOVENSKY CASOPIS PRO FYSIKU. (Ceskoslovenska akademie ved. Ustav technicke fysiky) Praha
Vol. 6, no. 2, Mar. 1956

Source: EEAL - LC Vol. 5. No. 10 Oct. 1956



Trlifaj, M.

CZECHOSLOVAKIA / Solid State Physics - Solid State Theory E-2

Abs Jour : Ref Zhur - Fizika, No. 5, 1957 No. 11579.

Author : Antonsik Emil, Trlifaj Miroslav
Inst : -
Title : Concerning the Remark by J. Koutecki.

Orig Pub : Ceskosl.casop. fys., 1956, 6, No.1, 99

Abstract : It is shown that in the solution proposed by J. Koutecki (Referat Zhur Fizika, 1957, 9139), the second term should vanish, and the constant C_2 vanishes from physical considerations. It is also noted that the approximation that was used to solve the equation and which has caused the strong objections on the part of Koutecki, is necessary only to construct the zero approximation, and later, in the subsequent approximations, all the previously discarded terms of the equation are taken into account.

It is indicated in the remark by the editor that

Card: 1/2

CZECHOSLOVAKIA / Solid State Physics - Solid State Theory E-2

Abs Jour : Ref Zhur - Fizika, No. 5, 1957 No. 11579

Abstract : Koutecki, upon being notified of the remark by Antoncik and Trlifaj, did not consider his conclusions refuted.

Card: 2/2

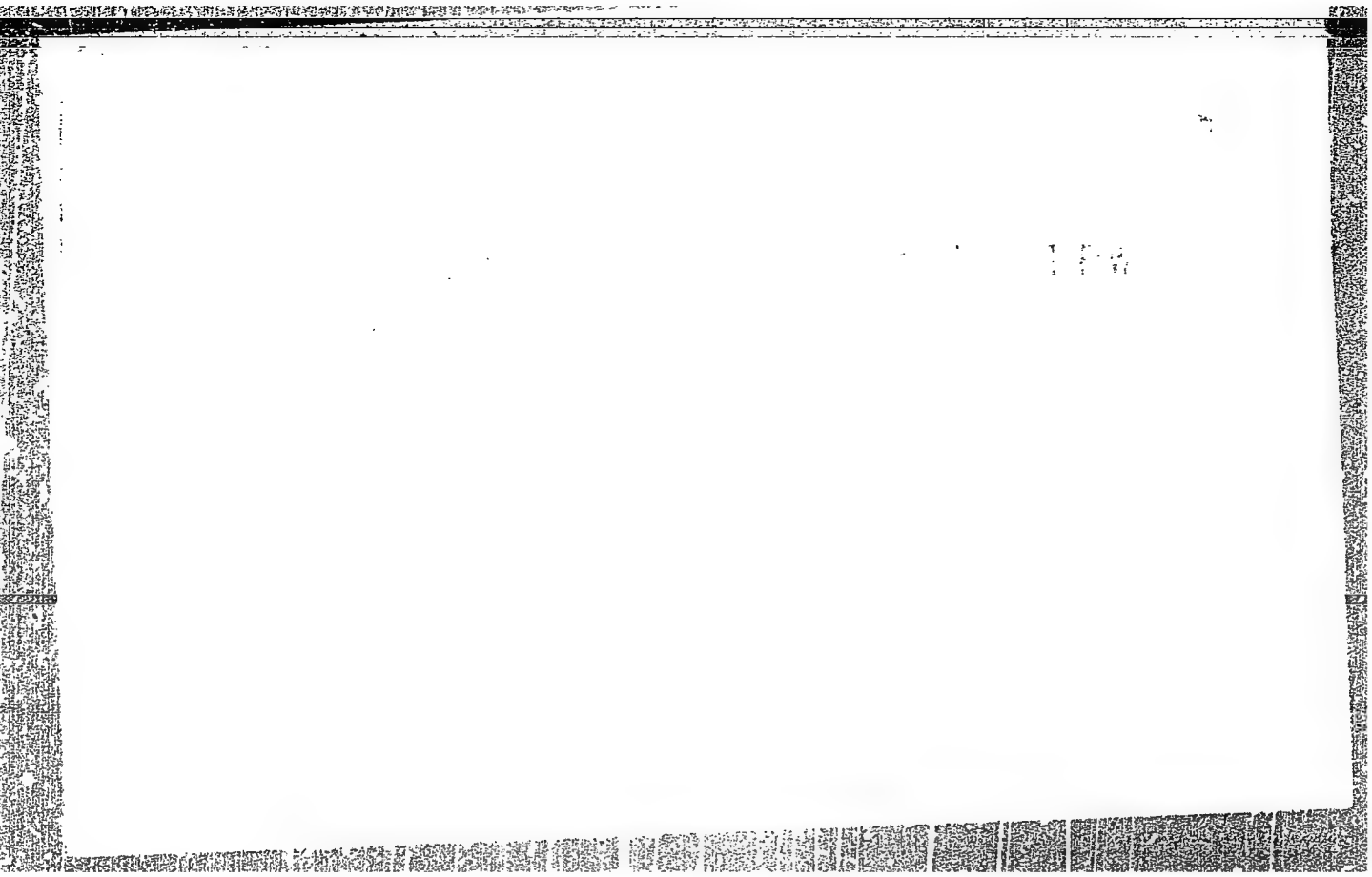
...HLEJ, K.

The theory of the diffraction of "localized" stimulated waves in solids. p. 372

CESKOSLOVENSKY CASOPIS PRO FYSIKU
VOL. 6, no. 4; July 1956

Czechoslovakia

SO. EAST EUROPEAN ACCESSIONS LIST vol. 5, no. 11 Nov. 1956



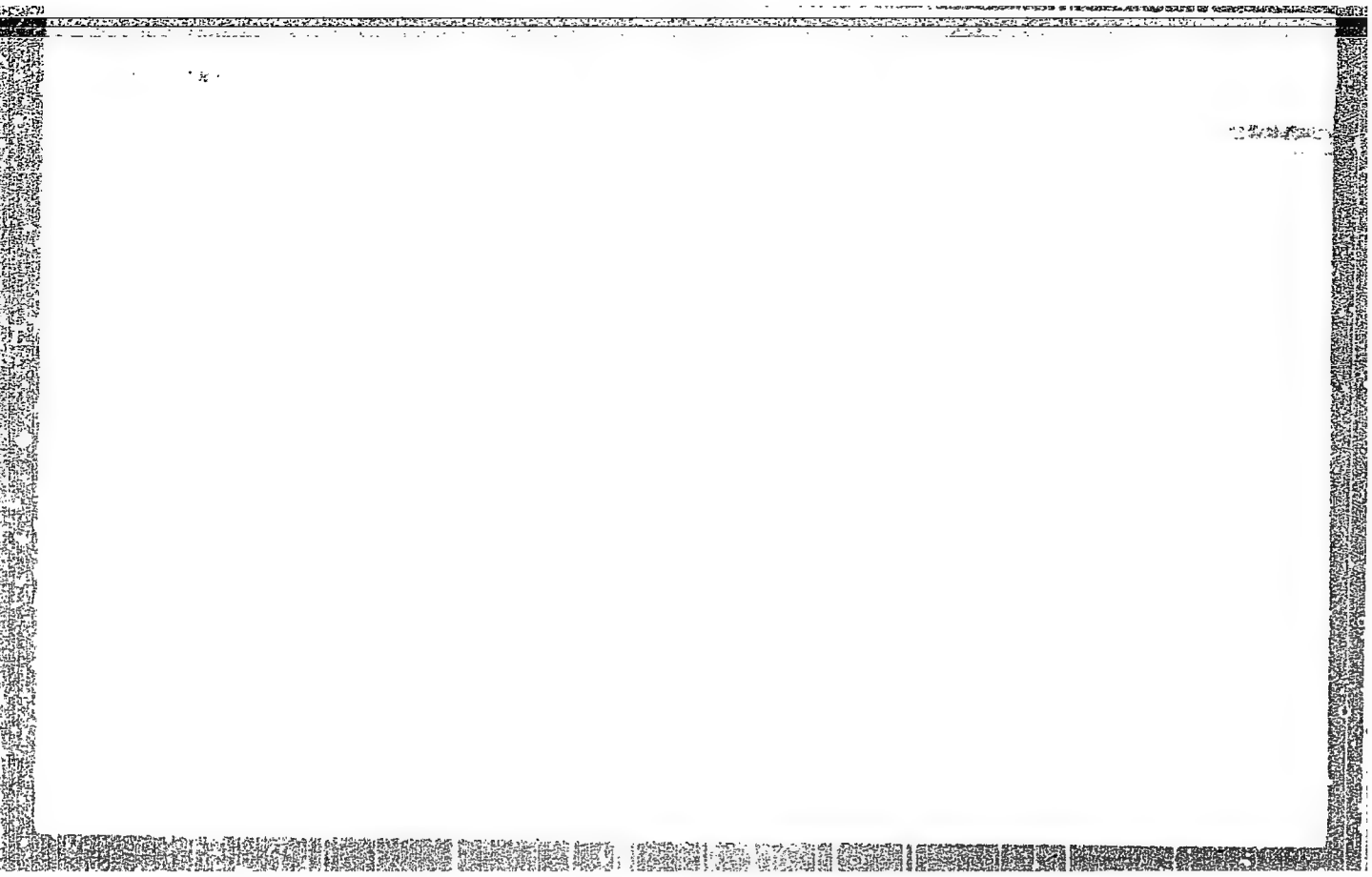
APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756620010-3"

TRLIFAJ, MIROSLAV

V The theory of the resonance transfer of excitation energy in solids Miroslav Trlifaj (Czechoslov. J. Phys. 5, 461-79 (1955). It is assumed that both the atom of the sensitizer and the atom of the activator interact only with a finite no. of neighboring atoms of the lattice, so that one can speak of "quasi-molecules" of the sensitizer and activator in a crystal. It is further assumed that the interaction of these quasi-molecules with the rest of the crystal can be expressed by means of configuration forces so-called external adiabatic potentials. The wave functions of the quasi-mols. are determined by means of an adiabatic approximation and the probability per sec. of the resonance transfer of the excitation energy is determined by means of perturbation theory. [illegible] sensitized luminescence [illegible] results obtained also hold for mols. dissolved in solids, liquid as well as liquids. The results obtained are used to elaborate a diffusion theory of excitons in crystals of alkali halides. The coeff. of diffusion of the excitons is calcd. in dependence on the temp. and on Stokes displacement of the emission band of an exciton. The mechanism of the external photoeffect in discolored alkali halide crystals induced by excitons was proved theoretically.

M. Charmoudarma

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756620010-3"



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756620010-3"

TRLIFAJ, L.

TRLIFAJ, L. Retardation and diffusion of neutrons in finite media according to the elementary diffusion theory. p. 127.

Vol. 5, no. 2, Mar. 1955
CESKOSLOVENSKY CASOPIS PRO FYZIKU
SCIENCE
Praha, Czechoslovakia

So: East European Accessions, Vol. 5, no. 5, May 1956

85559

S/089/60/009/005/002/020
B006/B070

21.1200

AUTHORS: Trlifay, L., Rochek, Y.

TITLE: Replacement of a Block in a Two-dimensional Quadratic Lattice

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 5, pp. 366 - 374

TEXT: A method was elaborated by A. D. Galanin, S. M. Feynberg and others for the calculation of the critical and boundary conditions in heterogeneous thermal reactors. A number of problems have been treated by this method, including the one considered here, namely, the replacement of a block in a lumped lattice by one with other properties. For example, this problem has already been solved for a three-dimensional array of point blocks (Ref.3), and an infinite cylindrical reactor with a quadratic lattice (Ref.4). In the present paper, a two-dimensional infinite quadratic lattice is considered, which is made up of infinitely long filament-like blocks. Just like Galanin (Ref.1), the present authors assume that the finite nature of the transverse dimensions can be taken into account by introducing effective constants. It is further

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Replacement of a Block in a Two-dimensional Quadratic Lattice

S/089/60/009/005/002/020
B006/B070

assumed that the slowing down and diffusion of thermal neutrons can be satisfactorily described in diffusion-age approximation, and that the absorption of resonance neutrons in the blocks is negligible. For the determination of neutron density distribution in this approximation, it suffices to know the thermal neutron distribution in the lattice on the surface of the block. At first, the forms of the general solutions of the density distribution functions are given for the case of an active, a critical, and an inactive medium. Subsequently, it is shown how the method of Feynberg must be modified for a two-dimensional inactive medium. A cylindrical neutron-absorbing block located in an infinite, homogeneous, and inactive medium is considered. The solution obtained for this case is analogous to that found by Galanin (Ref.1). This method is not applicable to an active medium; for this, a method (Ref.2) taken from quantum field theory is modified. Finally, the case of an infinite critical lattice is considered as a limiting case of the two above cases. The authors proceed from a formulation for the thermal neutron density in a homogeneous medium in diffusion approximation. It is found that before the formulas derived can be of practical use, long numerical calculations are necessary. A. D. Galanin is thanked for discussions.

85552

Replacement of a Block in a Two-dimensional Quadratic Lattice

S/089/60/009/005/002/020
B006/B070

There are 1 figure and 5 references: 2 Soviet, 2 US, and 1 Swiss.

ASSOCIATION: Institut yadernykh issledovaniy ChSAN, Praga (Institute of Nuclear Research of ChSAN, Prague)

SUBMITTED: January 28, 1960

Card 3/3

TRLIFAY, L.; ROCHEK, Y. [Rocek, J.]

Replacement of a block in a two-dimensional rectangular array.
Atom.energ. 9 no.5:366-374 N '60. (MIRA 13:11)

1. Institut yadernykh issledovaniy Chekholsovatskoy AN, Praga.
(Nuclear reactors)

TRLIFAY, L.

"Variation Method of Homogenizing a Heterogeneous Medium," by L. Trlifay, Institute of Nuclear Physics, Prague, Atomnaya Energiya, Vol 2, No 3, Mar 57, pp 231-239

Homogenization of a heterogeneous medium is carried out through the use of the solution of a variation problem concerning the kinetic equation for single-energy neutron diffusion.

The article determines that the value of the homogenization constants of the heterogeneous medium depend on the orientation of neutron flux density and the anisotropy of the heterogeneous medium. They are found to be equal to the value of the constants for a homogeneous medium.

It is noted that this latter result contradicts results obtained by J. Spinrad (J of Appl Phys 26, 548, 1955). "Our results, however, are more accurate since they were obtained through the use of kinetic theory, whereas Spinrad used elementary neutron diffusion theory." (U)

Sum. 1360

TRLIFAJ M.

A note on the group analysis of the wave functions of valence electrons in a crystal. p.97 (Czechoslovak Journal Of Physics. Vol. 1, no.3/4, 1952) Czechoslovakia

SO: Monthly List of East European Accessions, Vol. 2, #8, Library of Congress, August 1953, Incl.

TRLIFAJ M.

The electron theory of metallic magnesium. p. 110

(Czechoslovak Journal of Phusics. Vol. 1, no. 3/4, 1952) Czechoslovakia

SO: Monthly List of East European Accessions, Vol. 2, #8., Library of Congress, August 1953, Incl.

TRLIFAJ, M.
Trlifaj, M.

Thermic and nonluminous electronic processes in the interferential centers of ionic crystals. p.1.

(CESKOSLOVENSKY CASOPIS PRO FYSIKU. Vol. 5, no. 1, Jan. 1955.)

SO: Monthly List of East European Accession, (EEAL), LC, Vol. 4, No. 9, Sept. 1955, Uncl.

TRLIFAJ, M.

CZECHOSLOVAKIA/Physical Chemistry. Crystals. B

Abs Jour: Ref Zhur-Khimiya, No 22, 1958, 73090.

Author : Miroslav Trlifaj.
Inst :
Title : Properties of Exitons Produced at Passage of Rapid Charged Paricles Through Crystals.

Orig Pub: Ceskosl. casop. fys., 1957, 7, No 6, 634-640; Chekosl. fiz. zh., 1957, 7, No 6, 667-673.

Abstract: No abstract.

Card : 1/1

L 22369-66 EWT(1)/T IJP(c)
ACC NR: AP6009365 SOURCE CODE: CZ/0055/65/015/011/0780/0796

AUTHOR: Trlifaj, M.

ORG: Institute of Physics, Czechoslovak Academy of Sciences, Prague

TITLE: Nonradiative decay of excitons on ionized donors and acceptors in semiconductor and dielectric crystals

SOURCE: Chekhoslovatskiy fizicheskiy zhurnal, v. 15, no. 11, 1965, 780-796

TOPIC TAGS: dielectric crystal, semiconductor crystal, crystal decay, exciton, ionized plasma, perburbation theory, electron trapping, quantum mechanics

ABSTRACT: The possible process of nonradiative decay of excitons with a large radius on ionized donors and acceptors in semiconductor and dielectric crystals have been theoretically investigated in the first approximation by means of time perturbation calculus of quantum mechanics, using the method of second quantization. Theoretical relations were found for the probability/sec of nonradiative decay of excitations on ionized acceptors in Cu_2O crystals and on electron-trapping levels in CdS crystals. Orig. art. has: 86 formulas. [Based on author's abstract] [NT]

SOV REF: 002

Card 1/1 SUB CODE: 20/ SUBM DATE: 09Apr65/ ORIG REF: 003/ OTH REF: 004

L 2408-66 EWT(1)/EPA(s)-2/ T IJP(c) GG

ACCESSION NR: AP4041977 CZ/0055/64/014/007/0517/0525

AUTHOR: Trlifaj, M. 44,55

TITLE: The equation for the singlet and triplet spin states of the electron-hole pair in dielectric crystals in the framework of the method of effective mass

SOURCE: Chekhoslovatskiy fizicheskiy zhurnal, v. 14, no. 7, 1964, 517-525

TOPIC TAGS: singlet spin state, triplet spin state, electron hole pair, multi-electron problem, dielectric crystal, effective mass, spin effect, exchange effect, Bloch function

ABSTRACT: In this investigation the reduction is undertaken, in the framework of the method of effective mass, of the multielectron problem of the excited state of a crystal taking into account the exchange and spin effects between electrons. In previous studies of the reduction of the multielectron problem of the excited state of an ideal dielectric crystal, the exchange members between the electrons are usually neglected. This neglect finds expression in the resulting equation in that the motion of the electron and hole is determined only by the reciprocal electrostatic effect and is dependent on the spin state. Attention is given,

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L 2408-66
ACCESSION NR: AP4041977

3

therefore, to the possibility of obtaining an expression in the general form for the influence of the exchange and spin effects between electrons in the resulting two-particle equation with the help of incremental potential energy between the electron and the hole which is dependent on its coordinates and spin. In this point the results of this investigation, which are valid for large electron and hole path radii, differ from the results of other investigators cited in text. The Bloch functions in the Hartree-Fock approximation are used as initial wave functions of the electrons in the formulation of the multielectron problem and the solution of the problem follows by the method of the second quantization with the aid of hole formalism. The possibile mechanism of propagation of the excitation energy supplied to the crystal in the formation of the electron-hope pair is discussed with the aid of the nonradiative transmission. Orig. art. has: 33 formulas.

ASSOCIATION: Institute of Physics, Czechosl. Acad. Sci., Prague

SUBMITTED: 02Jan64 ENCL: 00 SUB CODE: SS

NO REF SOV: 002 OTHER: 005

GC

Card 2/2

TRLIFAJ, M.

An equation for singlet and triplet spin states of an electron-hole-pair in dielectric crystals within the framework of the effective mass method. Chekhosl fiz zhurnal 14 no. 7: 517-525 '64.

1. Institute of Physics, Czechoslovak Academy of Sciences, Prague 8, Lumumbova 1.

TRLIFAJ, M.

Nonradiative ionization of perturbation centers by means of excitons in semiconducting and dielectric crystals. Chekhosl fiz zhurnal 14 no.4:227-239 '64.

1. Institute of Physics, Czechoslovak Academy of Sciences, Prague 8, Lumumbova 1.

TRLIFAJ, M.

Expansion of the exciting force in crystals in the form of exciton complexes; double excitation. Chekhosl fiz zhurnal 13 no.9:631-643 '63.

Energy spectrum and the middle free path of deforming excitons in molecular crystals. 644-661

1. Fyzikalni ustav, Ceskoslovenska akademie ved, Praha.

STRIZOVA, V.; TRLIFAJOVA, J.

The neutralization of B. pertussis toxin in a tissue culture.
J. hyg. epidem. (Praha) 8 no.4:428-432 '64.

1. Institute of Epidemiology and Microbiology, Prague.